IN THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

1. (previously presented) Apparatus for use in a video image de-interlacer comprising:

a frame interpolator for yielding a frame based luminance value for a missing pixel by using frame based interpolation;

a field interpolator for yielding a field based luminance value for a missing pixel by using field based interpolation;

a luminance difference unit for obtaining luminance value differences of pixels in prescribed fields of an image in accordance with prescribed criteria;

a motion detector supplied with prescribed ones of said luminance value differences for generating a motion metric value at a missing pixel and for filtering said pixel differences to remove aliases under predetermined motion conditions;

a spatial median filter supplied with at least three of said motion metric values for determining a median motion metric value and for removing random noise from said luminance differences without creating spurious motion values; and

a controllable combiner supplied with said frame based luminance value and said field based luminance value and being responsive to a representation of said median motion metric value to controllably supply as an output a luminance value for said missing pixel, wherein said controllable combiner, in response to said representation of said median motion metric value indicating the image is still, outputs said frame based luminance value and, in response to said representation of said median motion metric value indicating motion in the image, outputs said field based luminance value.

2. (original) The apparatus as defined in claim 1 wherein said spatial median filter is a nine-value spatial median filter.

3. (canceled)

4. (Currently Amended) The apparatus as defined in claim ~~3~~ 1 wherein said frame based luminance value is generated by said frame interpolator in accordance with $C_0 = C_{-1}$, where C_0 is the luminance value of the missing pixel in field f_0 and C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field f_0, and said field based luminance value is generated by said field interpolator in accordance with $C_0 = \frac{(N_0 + S_0)}{2}$, where N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing pixel, and S_0 is the luminance value of a pixel below of and in the same field f_0 as the missing pixel.

5. (original) The apparatus as defined in claim 1 wherein said luminance difference unit generates a plurality of prescribed luminance value differences of pixels in prescribed fields of the image, and said motion detector employs prescribed relationships of said luminance value differences to generate said motion metric value.

6. (original) The apparatus as defined in claim 5 wherein said luminance difference unit generates a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, and generates at least a second luminance difference value in accordance with $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel , N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

7. (original) The apparatus as defined in claim 6 wherein said motion detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_a)$, where Δ is said motion metric value.

8. (original) The apparatus as defined in claim 5 wherein said luminance difference unit generates a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1}

relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, generates a second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel, and generates at least a third luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

9. (original) The apparatus as defined in claim 8 wherein said motion detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

10. (original) The apparatus as defined in claim 1 further including a look-up table including blending factor values related to said median motion metric values and being responsive to said median motion metric value from said spatial median filter for supplying as an output a corresponding blending factor value as said representation of said median motion metric value.

11. (original) The apparatus as defined in claim 10 wherein said controllable combiner is responsive to said blending factor for supplying as an output a luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1-\alpha)C_{-1}$, where C_0 is the luminance value of the missing pixel in field f_0, C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field f_0, N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the missing pixel and α is the blending factor.

12. (original) The apparatus as defined in claim 11 wherein said luminance difference unit generates a plurality of prescribed luminance value differences of pixels in prescribed fields of the image, and said motion detector employs prescribed relationships of said luminance value differences to generate said motion metric value.

13. (original) The apparatus as defined in claim 12 wherein said luminance difference unit generates a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, and generates at least a second luminance difference value in accordance with $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel , N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

14. (original) The apparatus as defined in claim 13 wherein said motion detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_a)$, where Δ is said motion metric value.

15. (original) The apparatus as defined in claim 10 wherein said luminance difference unit generates a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, generates a second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel, and generates at least a third luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

16. (original) The apparatus as defined in claim 15 wherein said motion detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

17. (previously presented) Apparatus for use in a video image de-interlacer comprising:

a frame interpolator for yielding a frame based luminance value for a missing pixel by using frame based interpolation;

a field interpolator for yielding a field based luminance value for a missing pixel by using field based interpolation;

a luminance difference unit for obtaining luminance value differences of pixels in prescribed fields of an image in accordance with prescribed criteria;

a motion detector supplied with prescribed ones of said luminance value differences for generating a motion metric value at a missing pixel and for filtering said pixel differences to remove aliases under predetermined motion conditions;

a look-up table including blending factor values related to said motion metric values and being responsive to supplied motion metric values for supplying as an output corresponding blending factor values;

a spatial median filter supplied with at least three of said blending factor values for determining a median motion metric value and for removing random noise from said luminance differences without creating spurious motion values; and

a controllable combiner supplied with said frame based luminance value and said field based luminance value and being responsive to a said median blending factor value to controllably supply as an output a luminance value for said missing pixel,

wherein said controllable combiner, in response to said representation of said median motion metric value indicating the image is still, outputs said frame based luminance value and, in response to said representation of said median motion metric value indicating motion in the image, outputs said field based luminance value.

18. (original) The apparatus as defined in claim 17 wherein said spatial median filter is a nine-value spatial median filter.

19. (canceled)

20. (original) The apparatus as defined in claim 17 wherein said controllable combiner is responsive to said blending factor for supplying as an output a luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1-\alpha)C_{-1}$, where C_0 is the luminance value of the missing pixel in field f_0, C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field f_0, N_0 is the luminance value of a

pixel above of and in the same field f_0 as the missing pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the missing pixel and α is the blending factor.

21. (original) The apparatus as defined in claim 20 wherein said luminance difference unit generates a plurality of prescribed luminance value differences of pixels in prescribed fields of the image, and said motion detector employs prescribed relationships of said luminance value differences to generate said motion metric value.

22. (original) The apparatus as defined in claim 21 wherein said luminance difference unit generates a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, and generates at least a second luminance difference value in accordance with $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel , N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

23. (original) The apparatus as defined in claim 22 wherein said motion detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_a)$, where Δ is said motion metric value.

24. (original) The apparatus as defined in claim 21 wherein said luminance difference unit generates a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, generates a second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing

pixel, and generates at least a third luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

25. (original) The apparatus as defined in claim 24 wherein said motion detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

26. (previously presented) A method for use in a video image de-interlacer comprising the steps of:

frame interpolating to yield a frame based luminance value for a missing pixel by using frame based interpolation;

field interpolating to yield a field based luminance value for a missing pixel by using field based interpolation;

obtaining luminance value differences of pixels in prescribed fields of an image in accordance with prescribed criteria;

filtering said pixel luminance value differences to remove aliases under predetermined motion conditions;

in response to prescribed ones of said luminance value differences, generating a motion metric value at a missing pixel;

spatial median filtering at least three of said motion metric values to determine a median motion metric value and to remove random noise from said luminance differences without creating spurious motion values; and

controllably combining said frame based luminance value and said field based luminance value and in response to a representation of said median motion metric value controllably supplying as an output a luminance value for said missing pixel,

wherein said step of controllably combining, in response to said representation of said median motion metric value indicating the image is still, outputs said frame based luminance value and, in response to said representation of said median motion metric value indicating motion in the image, outputs said field based luminance value.

27. (original) The method as defined in claim 26 wherein said step of spatial median filtering employs a nine-value spatial median filter.

28. (canceled)

29. (Currently Amended) The method as defined in claim ~~28~~ 26 wherein said step of frame interpolating includes a step of generating said frame based luminance value in accordance with $C_0 = C_{-1}$, where C_0 is the luminance value of the missing pixel in field f_0 and C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field f_0, and said step of field interpolating includes a step of generating said field based luminance value in accordance with $C_0 = \frac{(N_0 + S_0)}{2}$, where N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing pixel, and S_0 is the luminance value of a pixel below of and in the same field f_0 as the missing pixel.

30. (original) The method as defined in claim 26 wherein said step of obtaining luminance value differences includes a step of generating a plurality of generating a motion metric value includes a step of employing prescribed relationships of said luminance value differences to generate said motion metric value.

31. (original) The method as defined in claim 30 wherein said step of obtaining luminance value differences includes a step of generating a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, and a step of generating at least a second luminance difference value in accordance with $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel , N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

32. (original) The method as defined in claim 31 wherein said step of generating a motion metric value generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_a)$, where Δ is said motion metric value.

33. (original) The method as defined in claim 30 wherein said step of obtaining luminance value differences includes a step of generating a first luminance value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, a step of generating a second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel, and a step of generating at least a third luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

34. (original) The method as defined in claim 33 wherein said step of generating a motion metric value includes a step of generating said motion metric value in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

35. (original) The method as defined in claim 26 further including a step of employing a look-up table including blending factor values related to said median motion metric values and, in response to a supplied median motion metric value, supplying as an output a corresponding blending factor value as said representation of said median motion metric value.

36. (original) The method as defined in claim 35 wherein said step of controllably combining, in response to said blending factor, supplying as an output a luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1-\alpha)C_{-1}$, where C_0 is the luminance value of the missing pixel in field f_0, C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field f_0, N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the missing pixel and α is the blending factor.

37. (original) The method as defined in claim 36 wherein said step of obtaining luminance value differences includes a step of generating a plurality of prescribed luminance value differences of pixels in prescribed fields of the image, and said step of generating a motion metric value includes a step of employing prescribed relationships of said luminance value differences to generate said motion metric value.

38. (original) The method as defined in claim 37 wherein said step of obtaining luminance values differences includes a step of generating a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, and a step of generating at least a second luminance difference value in accordance with $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel , N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

39. (original) The method as defined in claim 38 wherein said step of generating a motion metric value includes a step of generating said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_a)$, where Δ is said motion metric value.

40. (previously presented) The method as defined in claim 35 wherein said step of obtaining luminance value differences includes a step of generating a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, a step of generating a second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel, and a step of generating at least a third luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a

luminance value of a pixel below of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.

41. (original) The method as defined in claim 40 wherein said step of generating a motion metric value includes a step of generating said motion metric value in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

42. (previously presented) A method for use in a video image de-interlacer comprising the steps of:

frame interpolating to yield a frame based luminance value for a missing pixel by using frame based interpolation;

field interpolating to yield a field based luminance value for a missing pixel by using field based interpolation;

obtaining luminance value differences of pixels in prescribed fields of an image in accordance with prescribed criteria;

filtering said pixel luminance value differences to remove aliases under predetermined motion conditions;

in response to prescribed ones of said luminance value differences, generating a motion metric value at a missing pixel;

in response to supplied motion metric values, utilizing a look-up table including blending factor values related to said motion metric values to supply as an output corresponding blending factor values;

spatial median filtering at least three of said blending factor values for determining a median blending factor value and to remove random noise from said luminance differences without creating spurious motion values; and

controllably combining said frame based luminance value and said field based luminance value and in response to said median blending factor value controllably supplying as an output a luminance value for said missing pixel,

wherein said step of controllably combining includes a step, responsive to said median blending factor value indicating the image is still, of outputting said frame based luminance value, and a step, responsive to said median blending factor value indicating motion in the image, of outputting said field based luminance value.

43. (original) The method as defined in claim 42 wherein said spatial median filter is a nine-value spatial median filter.

44. (canceled)

45. (original) The method as defined in claim 42 wherein said step of combining includes a step, responsive to said median blending factor, of supplying as an output a luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1-\alpha)C_{-1}$, where C_0 is the luminance value of the missing pixel in field f_0, C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field f_0, N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the missing pixel and α is the blending factor.

46. (original) The method as defined in claim 45 wherein said step of obtaining luminance value differences includes a step of generating a plurality of prescribed luminance value differences of pixels in prescribed fields of the image, and said step of generating a motion metric value includes a step of employing prescribed relationships of said luminance value differences to generate said motion metric value.

47. (original) The method as defined in claim 46 wherein said step of obtaining luminance value differences includes a step of generating a first luminance difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1, and a step of generating at least a second luminance difference value in accordance with $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the same field f_0 as the missing pixel , N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing pixel.